DOCUMENT RESUME

ED 233 813 PS 013 814

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TITLE Differentiating Programs for Academically Gifted Elementary Students.
PUB DATE Aug 83
NOTE 45p.
PUB TYPE Information Analyses (070) -- Reference Materials - Bibliographies (131) -- Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academically Gifted; *Acceleration (Education); Annotated Bibliographies; *Educational Practices; *Elementary Education; Glossaries; *Homogeneous Grouping; Literature Reviews; *Program Development
IDENTIFIERS *Differentiation

ABSTRACT

The literature review presented here was conducted to investigate various types of differentiation in programs for academically gifted elementary school students. For the purpose of the review, the term "academically gifted" refers to students with high general intellectual ability; no speciic level of intelligence is implied. Following an introductory discussion, a glossary and annotations for 39 relevant articles are provided. Subsequent contents are arranged topically in five categories. The first three categories focus on the major methods of differentiation: acceleration, enrichment, and homogeneous grouping. The remaining two groupings describe programs with varied alternatives and discuss factors to consider in differentiating programs or curricula. Included in the material on enrichment are citations concerning pull-out programs, regular classroom additives, and mentors. Listed in the section on homogeneous grouping are articles focusing on special schools, magnet schools, Saturday/summer programs, and program differentiation. Also provided in the document are a very brief overview of controversies concerning the gifted, a summary of findings, a brief discussion of conclusions, and a statement of recommendations. Appended are a short list of national resources for the gifted and talented, along with names, addresses, and brief descriptions of related national organizations. (RH)

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DIFFERENTIATING PROGRAMS FOR ACADEMICALLY GIFTED ELEMENTARY STUDENTS

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Submitted in partial fulfillment of the requirements
for the course E591 --- Exit Project
Indiana University at South Bend
August, 1983

PS 013814

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INTRODUCTION

A definition of the term gifted children comes in many different versions. The one that follows takes into account the variety of dimensions of giftedness.

"Gifted children are those identified by professionally qualified persons who by virtue of outstanding abilities are capable of high performance." (Marland 1972:10)

In 1972, the United States Office of Education recognized that the traits of gifted individuals fall into six areas: general intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual and performing arts and psychomotor ability. A gifted individual was designated as one who possesses exceptional abilities in any of these areas, either singly or in combination. (Marland 1972:10)

For the purpose of this paper, the focus will primarily be on the student with high general intellectual ability. This group of students will be termed academically gifted. Because of this group's ability to manipulate internally learned symbol systems, they seem to achieve a higher rate of success in the school setting. (Gallagher 1975:11)

It is difficult to discuss giftedness without mention of I.Q. Terman in his study of 1500 gifted children set a cut off of 140 I.Q. (1954:222-223) Renzulli in his "Revolving Door Concept" would include children with an I.Q. of 115 so not

to miss an underachieving child. (Delisle and Renzulli 1982: 89) Some feel an I.Q. of 130 is necessary for a child to fall in the gifted range. (Tuttle 1978:5)

Because of this conflict of ideas, a set I.Q. will not be an essential component of the definition of "giftedness" in this paper.

FACTORS IN THE CONTROVERSY

There has been a strong ebb and flow over the past three decades in public education's interest in gifted students. Little interest was shown in the early 1950's. However, in the late 1950's and early 1960's there was a resurgence of concern. This period is often referred to as the Sputnik era. Enthusiasm died during the late 1960's and early 1970's. In the late 1970's again the tide turned toward support of gifted programming. (Gallagher 1982:180)

Contrary to widespread belief, gifted students cannot ordinarily excel without assistance. Research done on 251 high ability students, reported that 54.6 percent of these students were working at least four grade levels below their achievement level. (Gourley 1975:1) This is not only a waste of intellectual resources but a tragic social loss as well. Gallagher feels the gifted are our next generation of leaders and producers. How they fare in the educational system may well affect the future of our society. (1975:9)

Gifted students have special needs which are different from the needs of average and low ability children. (Feldhusen and Sokol 1982:51) Many teachers and administrators prefer to keep the gifted student in the regular classroom. In many instances however, teachers are too busy trying to help students who are not working up to grade level to find time to meet the needs of the gifted. (Renzulli and others 1982:185) In this situation, a regular classroom might constitute a restrictive environment, to use a phrase of the mainstreaming movement. (Hershey 1982:54)

> If it is true that a gifted child needs a differentiated curriculum, what are the alternatives? The three most widely used forms of differentiation are: acceleration, enrichment and homogeneous groupings. (Tuttle 1978:15) Within the framework of these forms are a wide variety of implementation plans.

STATEMENT OF THE PROBLEM

The public is once again demanding better educational opportunities for our most able students. Scholars in the field of gifted education feel that exceptional students need some form of differentiation from the regular curriculum. The problem exists to decide what form this differentiation should take.

PURPOSE OF THE STUDY

The purpose of the study was to analyze the research on various types of differentiation for academically gifted

elementary students. Recommendations will then be made on how best to meet the needs of this student population.

ORGANIZATION OF THE STUDY

First presented will be the three major methods of differentiation: acceleration, enrichment and homogeneous grouping. Next, programs that incorporate a variety of alternatives are examined. Factors to consider when differentiating a program or curriculum for gifted students will follow.

The annotations are arranged in accordance with the following priorities:

-- within major headings they are arranged alphabetically;

-- in the case of subheadings, they are alphabetized by subheading.

LIMITATIONS OF THE STUDY

This study did not attempt to discuss the other areas of giftedness or programs to meet their needs. Only the area of academically gifted students was covered. The controversy of how best to identify gifted students was only mentioned in relation to how students were selected for programs analyzed in the annotations. The lack of "research" articles contrasted with "opinion pieces" did not hamper the study although it is a concern to be addressed.

GLOSSARY

academically gifted -- students with superior ability or aptitude for academic learning. (Barnett 1980:1)

acceleration -- the process of progressing through the school grades at a rate faster than that of the average child, either by skipping grades or by rapidly mastering the work of one grade and moving on to the next higher grade. (Good 1973:4)

affective -- relating to feelings and emotions. (Webster 1971:35)

bilingual -- having equal facility in the use of two languages. (Good 1973:62)

Bloom's Taxonomy -- a structured set of educational objectives arranged in a hierarchy of significance. (Page and Thomas 1977:335)

chronological age (CA) -- the amount of time that has elapsed since an individual's birth. (Good 1973:20)

cluster grouping -- clustering of related items within any given collection of persons. (Page and Thomas 1977: 68)

cognitive -- that mental functioning involved in perceiving, knowing, and understanding. (Good 1973:310)

computational -- that phase of mathematics which emphasizes the operational skills only. (Good 1973:353)

consultant -- an expert in a specialized field, without administrative authority, whose advice is sought in improving an educational program, the facilities offered, or methods of cooperation. (Good 1973:131)

creative thinking -- thinking that is inventive, that reaches new solutions to old problems, or that results in thoughts original to the thinker. (Good 1973:608)

critical thinking -- thinking that proceeds on the basis of careful evaluation of premises and evidence and comes to conclusions as objectively as possible through the consideration of all pertinent factors and the use of valid procedures from logic. (Good 1973:608)

cultural enrichment -- supplying aspects of the performing arts such as music, art, drama, dance and creative writing. (Stanley 1976:66-67)

differentiated instruction -- teaching in accordance with the individual's level of achievement and needs. (Good 1973:305)

disadvantaged -- a child who has an impoverished range of experience. (Good 1973:95)

elementary students -- a child enrolled in a course of study normally encompassed by grades one through six. (Good 1973:461)

enrichment -- the process of selectively modifying a curriculum by adding educational content to that which already exists.

-- a program for the gifted within the framework of the regular classroom; consists of deliberate differentiation of curriculum content and activities. (Good 1973: 212)

exceptional child -- a child who deviates intellectually in his growth and development so markedly from what is considered normal that he cannot receive maximum benefit from a regular school program and requires a special class or supplementary instruction and services. (Good 1973:95)

formative evaluation -- seeks to improve learning/teaching by feedback as the activity progresses to illustrate the effectiveness of the activity. (Page and Thomas 1977: 138)

generative -- the ability to produce new ideas, new systems, and new products. (Feldhusen and Sokol 1982:52)

gifted -- a child whose mental age is considerably higher than his actual age compared with children in the general population. (Good 1973:95)

heterogeneous grouping -- the classification of pupils for the purpose of forming certain groups having a high degree of dissimilarity. (Good 1973:269)

homogeneous grouping -- the classification of pupils for the purpose of forming instructional groups having a relatively high degree of similarity in regard to certain factors that affect learning. (Good 1973:269)

horizontal enrichment -- a program to provide opportunities for gifted pupils to broaden their experience by working in areas not ordinarily explored by the average child. (Good 1973:212)

Individual Education Program (IEP) -- Under PL 94-142 every child identified as handicapped must have a written IEP developed and implemented. The program for each child must include: a statement of the child's present level of performance; a statement of goals and objectives; a statement of specific services to be provided; the projected date for initiation of services; and evaluation procedures. (Davis 1980:83)

Intelligence Quotient (IQ) -- a measure for expressing level of mental development in relation to chronological age; obtained by dividing the mental age (as measured by a general intelligence test) by the chronological age and multiplying by 100. (Good 1973:465)

Iowa Test of Basic Skills (ITBS) -- a comprehensive achievement battery designed to assess "generalized intellectual skills and abilities" in pupils grades 3-8. (Davis 1980:205)

locus of control -- refers to an individual's perception of the place of events as determined internally by his/her own behavior against luck or external forces. (Page and Thomas 1977:209)

mainstreaming -- integration of children with special educational needs with the normal school population. (Page and Thomas 1977:211)

magnet schools -- a school offering special courses not available in the ordinary school program and attracting students on a voluntary basis from all parts of a school district without reference to the usual attendance zones. (Page and Thomas 1977:211)

mentor -- a close, trusted, and experienced counselor or guide. (Webster 1971:1412)

precocious -- a child who is exceptionally advanced beyond the norm mentally. (Good 1973:96)

primary-aged education -- that division of the elementary school including grades one to three. (Good 1973:436)

problem solving -- a process employed to discover or educe new relationships among things observed or sensed. (Good 1973:439)

pull out -- a program for the gifted in which students leave the regular classroom and work in areas of enrichment and acceleration with a special resource teacher. (Parke 1983:29)

qualitative -- distinguished by differences in attributes rather than by numerical differences. (Good 1973:464)

quantitative -- concerned with measurement. (Good 1973:464)

resource room -- an organizational plan in which children are registered with regular teachers who assume the major responsibility for their education; the resource teacher and room are utilized as the need arises. (Good 1973: 496)

self-concept -- the individual's perception of himself as a person, which includes his abilities, appearance, and other phases of daily living. (Good 1973:524)

self-esteem -- the judgement and attitude an individual holds toward himself. (Good 1973:525)

self-instructional center -- an area of the instructional material center where a library of programmed materials is maintained for students and teachers. (Good 1973:85)

sociometry -- measurement of the interpersonal relationships prevailing among members of a group. (Good 1973:543)

summative evaluation -- at the conclusion of any activity to determine the effectiveness of that activity. (Page and Thomas 1977:330)

talented -- possessing special aptitude. (Webster 1971:2333)

vertical enrichment -- the curricular provision for advanced work or further specialization in the same area of learning. (Good 1973:213)

ANNOTATIONS

ACCELERATION

Horne, Don L., and Dupuy, Paul J., "In Favor of Acceleration for Gifted Students," Personnel and Guidance Journal 60:103-6, October, 1981.

Horne and Dupuy gave a narrative history of the pros and cons of acceleration and enrichment programs for academically gifted students. They stated that in enrichment programs students were not separated from their peers and face no unusual social readjustments, which they viewed as positive. On the negative side, they found many reasons to oppose enrichment programs: lack of funding from states for programs, lack of motivation on the part of the students to enrichment, and teacher bias against enrichment. Horne and Dupuy were steadfast in their preference of acceleration. Many cases were shown to disprove the idea of social or emotional problems which some attribute to acceleration. Also shown were cases of students who succeeded due to acceleration. The authors concluded after looking at both types of programs that acceleration was a better option for many students.

Klausmeirer, Herbert J., "Effects of Accelerating Bright Older Elementary Pupils: A Follow-Up," Journal of Educational Psychology 54:165-71, 1963.

A research study of the effects of accelerating gifted elementary students was undertaken by Klausmeirer. The subjects were 50 boys and 50 girls, 10 of each sex having been accelerated from second to fourth grade after being identified as gifted. These students were compared to nonaccelerated pupils of superior ability and nonaccelerated pupils of average ability. A battery of tests were given to all groups at the end of fifth grade. They ranged from achievement to attitude tests. The results showed that students after the second year of acceleration surpassed pupils of average abilities on all tests and were equal to students of superior abilities who had not been accelerated. One objection to acceleration was that students miss subject matter which leads to lower achievement. This was shown to be invalid. The study also showed that no personal, social or emotional maladjustments were evident because of acceleration. Klausmeirer recommended the acceleration of students in the top 5 percent of the population.

Mirman, Norman, "Are Accelerated Students Socially Maladjusted?" Elementary School Journal 62:273-6, February, 1962.

A study was carried out in Los Angeles that involved 128 high-school seniors. One group was made up of students who had been accelerated in elementary school and the other was made up of students who progressed normally through school. All 128 had an I.Q. of 120 or higher. The purpose of the research was to determine if acceleration had led to social maladjustment. A variety of measures were used to see if the students had a healthy interest in friends and school. Mirman asserted that this information was a good indicator of healthy social and emotional adjustment. Results of the study showed that 95% of the accelerated students liked school. Apparently acceleration helped maintain interest in schoolwork. The types of activities preferred by accelerated and nonaccelerated students were similar, with the accelerated taking an active part in athletics and student organizations. The accelerated students overwhelmingly recommended that children be allowed to skip grades. (85.9%) Implications of the study were that personal adjustment is not appreciably affected by acceleration and should not be a deterrent to its use.

Payne, Joseph, "The Mathematics Curriculum for Talented Students." Arithmetic Teacher 28:18-21, February, 1981.

Payne identified students talented in mathematics as ones who excel in logic and abstract reasoning, problem solving and creative thinking. He felt the curriculum for these students should aim for greater depth and greater breadth. One area that must be a building block is that of computational rules. Once the rules are understood acceleration may begin. Rayne recommended a K-8 curriculum which would be covered in seven years, allowing the student to take advanced algebra, high school math and calculus. Payne asserted that the overriding need was for higher level cognitive thinking and reasoning skills to supplement the basic math curriculum.

Renzulli, Joseph S., and others, "Curriculum Compacting: An Essential Strategy for Working with Gifted Students," Elementary School Journal 82:185-94, January, 1982.

The major purpose of this article was to present a plan for "compacting" or streamlining the regular classroom curriculum for gifted students. Compacting consisted of finding areas of advanced learning and then testing students to find areas of strengths and weaknesses. Areas of strengths were skipped and areas of weakness were taught or reviewed. The researchers found this approach acceptable in meeting the needs of the gifted. First, it relieved students of the boredom that resulted from unchallenging work. Secondly, it provided a legitimate procedure for allowing advanced students time for enriched or accelerated work inside and outside the regular classroom.

Stanley, Julian C., Accelerating the Educational Progress of Intellectually Gifted Youths, Educational Resources Information Center, ED 087 816, Spencer Foundation, Chicago, August, 1973, 28 pp.

Stanley asserted through his studies at John Hopkins that acceleration is the desirable alternative for gifted youth. Results of the first two years of the Study of Mathematically and Scientifically Precocious Youth (SMSPY) showed that acceleration was not only feasible but demanded for students eager to move ahead. Skipping school grades and studying in special classes were recommended. They are simple to carry out, inexpensive, and supplement regular school practices. Studies showed that students who had the desire to move ahead and were willing to expend the extra energy it took to succeed had no ill effects.

Stanley, Julian C., "The Case for Extreme Educational Acceleration of Intellectually Brilliant Youths," Gifted Child Quarterly 20:66-75, Spring, 1976.

Stanley used the case study approach to enlighten the reader about grade acceleration. He began by describing the terms enrichment and acceleration. According to Stanley, enrichment takes four forms: busy work, irrelevant academic enrichment, cultural enrichment, and relevant academic enrichment. All of these represent horizontal movement, that which is tied to a particular grade or age range. By contrast, academic acceleration is vertical. This means moving students to higher grade level material. Stanley concluded through his experience with academically gifted students at John Hopkins that grade acceleration was more beneficial than enrichment programs.

Terman, Lewis, and Oden, Melita, The Gifted Child Grows Up (vol. 4 in Genetic Studies of Genius) Stanford University Press, Stanford, CA, 1947, 448 pp.

Terman and Oden conducted a follow-up study on the 1500 adults that, as children, participated in Terman's longitudinal study of highly gifted students. After review of the questionnaires and results of their findings, several recommendations were made. It was asserted that nearly all children of 135 I.Q. or higher should be promoted sufficiently to permit college entry by the age of 17 and preferably age 16. Acceleration of this extent would be especially desirable for those who plan to prepare for a professional career.

ENRICHMENT

Pull Out Programs

Barthe, Charles L., Program for Academically Talented Students, Educational Resources Information Center, ED 186 850, Paper presented at the Annual Meeting of the International Reading Association, St. Louis, May, 1980, 9 pp.

A research study was conducted using the participants of PATS (Program for Academically Talented Students). The students were involved in a pull-out program organized by each school's reading specialist. Criteria for entry was 130 I.Q. or above, 95 percent or higher on ITBS and teacher recommendations using Renzulli's Scale for Rating Behavioral Characteristics of Superior Students. Emphasis was placed on critical and creative thinking skills and individual projects. Fourth through sixth grade students involved in the program showed gains in their reading and math skills on the ITBS. Recommendations were for more programs for advanced learners.

Catmull, Joan, and others, Alternative Programming for the Gifted, Educational Resources Information Center, ED 141 967, Florida State Department of Education, Tallahassee, n.d., 27 pp.

Project Gateway is an enrichment program for academically gifted as well as creatively talented students in grades 1 through 8. Academically gifted students attended two sessions per week each lasting two and one-half hours. Creatively talented students attended the program every afternoon for one hour and forty-five minutes. The curriculum in both sections offered students a unique and diverse learning experience. Rationale for the program was that gifted students need continued challenges and stimulation, and that association with children of the same ability is an obvious source of motivation as is a differentiated curriculum. (For more information contact Project Gateway, Lafayette County Schools, Oxford, Mississippi.)

Delisle, James R., and Renzulli, Joseph S., The Revolving Door Identification and Programming Model: Correlates of Creative Production," Gifted Child Quarterly 26: 89-95, Spring, 1982.

This research study done by Renzulli looked at factors that indicated success in the "Revolving Door Identification and Programming Model." This is an enrichment program in which children "revolve in" for topics of special interest. He identified three factors: class ranking (high I.Q.), self-concept, and locus of control. His results showed that high class ranking was the greatest indicator of success in the program. However, a good self concept was also important. It was found that if a stringent ranking (95+ percentile and above) was the only requirement used in selection for the program, 56 percent of the successful children would have been missed. The implications, Renzulli stated, were for all enrichment programs to use other methods of program selection besides high I.Q.

Dunlap, James M., "Gifted Children in an Enrichment Program," Exceptional Children 21:135-37, January, 1955.

A study of an enrichment program grades 2 through 6 was undertaken by Dunlap. Students met for two 50 minute sessions each week to intensely study areas of interest. Comments from students, parents, and teachers indicated that the program was successful in motivating the gifted to make more effective use of their abilities. A follow-up study of the first 23 enrichment students to enter junior high school showed that they made up a large ratio (3½ to 1) of the honor roll students. Implications of this study are for school systems to develop gifted children's motivation and personal adjustment early so they can become effective, successful adults.

Keller, David J., "Akron's Exploratory School Program: A Program for Gifted and Talented in Mathematics and Science," School Science and Mathematics 80:577-82, November, 1980.

A goal of the Akron Public Schools was to improve math and science instruction for all children, but particularly the gifted. The result was the Exploratory School Program for gifted students, grades 4-6. A study was initiated to see how math and sciences scores could be improved after special enrichment classes. Students met daily for one hour and forty-five minutes to concentrate in these specific skill areas. During the first year (1978-1979), the program was only in operation for three months - March, April and May. The pre-post-test scores indicated that the mean grade level equivalent growth for the three month period was greater than one year in both mathematics and science. Results of the study have been received as so successful that a junior high school program was being developed.

Lytle, William Grant, and Campbell, Noma Jo, "Do Special Programs Affect the Social Status of the Gifted?" Elementary School Journal 80:93-97, November, 1979.

A controlled study was performed to see what effects special programming for the gifted had on peer acceptance. The study also investigated social acceptance measured by sociometry of three groups: gifted, high achievers and average. The subjects were 66 fourth grade students. Through a variety of test measures 22 students were assigned to a pull-out program. They were the experimental group. The second group designated as high achievers were in the initial group but did not meet criteria for the program. A control group was selected from the regular school population on the basis of average achievement test scores. Using a sociometric instrument, students answered questions pertaining to inter-personal relationships before and after the gifted program began. The study suggested that gifted children were accepted and perceived by their classmates as leaders. The gifted program showed no adverse social effects on the students.

Sawyer, Walter E., and Snapp, Carolyn, Utilizing the Museum Concept for Academically Talented Children, Educational Resources Information Center, ED 204 966, Paper presented at the Annual International Convention of the Council for Exceptional Children, New York, April, 1981, 24 pp.

This research study described the program concept used by Waterford-Halfmoon Schools in servicing their gifted population grades 4-6. This pull-out program was devised because of the small number of elementary pupils and budget restrictions. Students identified as being in the top 5 percent of their class met in a resource room to work on projects in the sciences or humanities. These projects were then developed into museum displays and shared with the community. Pre-test/post-test results indicated all objectives of the program were being met. These objectives included: taking responsibility for their work, increased oral and written expression, using inferences, and developing methods and processes of investigation. The implication was that other small communities could successfully use this approach which seemed to be of great benefit to gifted students.

Regular Classroom Additives

Brumbers, Stephan F., and Toledo, Victor, Bilingual Gifted and Talented Program. Final Evaluation Report, 1979-80, Educational Resources Information Center, ED 200 694, Office of Bilingual Education and Minority Languages Affairs, Washington, D.C., 1980, 17 pp.

A program for gifted Hispanic students in grades K-6 was conducted in New York City in 1979-80. The program was enrichment in addition to the regular classroom experience. Special attention was given to the selection of personnel. Results of questionnaires given to students and parents showed overwhelming support for the program. Test results showed marked gains in student's achievement test scores. Implications were that care must be taken in identification of bilingual students who may go undetected because of a language barrier, and thus not develop to full potential.

Parke, Beverly N., "Use of Self Instructional Materials with Gifted Primary-Aged Students," Gifted Child Quarterly 27:29-34, Winter, 1983.

Parke looked for a program which could be used by gifted students in "pull out" programs as well as the regular classroom. She was alarmed by studies that showed the scores of gifted children became more like those of other children, the longer they received identical programs. (Ness and Latessa, 1979) The purpose of the study was to examine the effects of a self-instructional mathematics program on the high-achieving primary-aged students. Her results showed that students using her self-instructional program made great gains when compared with students of comparable ability, who used the regular classroom curriculum. It appeared, from the results of this study, that self-instructional techniques may be an effective tool for gifted children.

Mentors

Gray, William A., "Mentor-Assisted Enrichment Projects for the Gifted and Talented," Educational Leadership 40: 16-21, November, 1982.

Using mentors with gifted students is not a new idea. Gray's study was different in that university students were voluntarily paired with gifted students of similar interests. These matches worked better than normal community mentors for several reasons. First, they were not as time consuming to locate and match. Second, they were young enough to relate to the youngsters; and third, they had time to help students carry out lengthy projects. Student response on both sides was overwhelming. Gray cautioned this is not an easy project to implement but from his study felt it was well worth the effort.

Booth, L., "Apprentice-Mentor Program for Gifted Students," Education Digest 46:38-40, December, 1980.

A mentor program, such as the one described by Booth, could be done in any gifted program. Excited students planned everything right along with the teacher. Journals were kept, expectations and responsibilities were discussed, outcomes were evaluated. The mentors were adult volunteers from the community and occupations ranged from librarian to pathologist. Booth identified the important successes of the program: students gained insight into a field of special interest, they developed a positive self-image through acceptance of large amounts of responsibility and the community gained a better perspective of gifted youngsters and received valuable services from them.

Boston, Bruce, The Sorcerer's Apprentice: A Case Study in the Role of the Mentor, Educational Resources Information Center, ED 126 671, Council for Exceptional Children, Reston, Virginia, 1976, 8 pp.

The mentor-pupil relationship is illustrated in the sorcerer and the apprentice concept. Characteristics of the mentor's art- such as teaching from the world to the students, and of the pupil- such as a willingness to experience are discussed. Implications for gifted child education are: matching the correct mentor with each pupil, allowing open-ended programs, and basing instruction on competencies and interests of the student.

HOMOGENEOUS GROUPING

Special Schools

Barbe, Walter, "Evaluation of Special Classes for Gifted Children," Exceptional Children 22:60-62, November, 1955.

The Major Works Program is a homogenecus grouping of gifted students in the Cleveland, Ohio public schools. A study of the effects on its former students was undertaken. A questionnaire was sent to all graduates of the program between the years of 1938 and 1952. According to the returns, the program had been successful. The majority of prior students (84.3%) favored special classes for gifted children. More than 50 percent had no suggestions for improvement. The least liked aspect of the program was lack of social contact with other students. Since 1941 this lack of interaction was changed in the program and later results showed this problem was less severe. Having been members of special gifted classes was reported as having aided them in making good adjustment by 61 percent of males and 74 percent of females. This contradicts the usual complaint again homogeneous grouping that such programs lead to more difficulty in adjusting to others.

Gourley, Theodore J., and others, Programs for Gifted Students: A National Survey, Educational Resources Information Center, ED 129 000, Educational Improvement Center, Pitman, N.J., 1975, 40 pp.

Citings were made of several homogeneous gifted programs around the country. One such program was the Talcott Mountain Science Center. It is a private non-profit school serving several school districts. The enrollment is limited to 400 students and the pupil teacher ratio is 10-1. This program in Avon, Connecticut is geared to serving students gifted in the sciences. Another example given was the Pine View Program which provides for students in grade 4-12. All areas of the basic curriculum are covered. Students analyzed in these programs showed a high degree of academic success as well as gaining many positive social benefits.

Minigrant Program for the Academically Gifted-Phase II: E.S.E.A. Title IV-C, Educational Resources Information Center, ED 189 754, Bureau of Elementary and Secondary Education, Washington, D.C., December, 1980, 89 pp.

An evaluation of a program for gifted disadvantaged was carried out in Washington, D.C. Six elementary schools servicing approximately 300 students were the sites for the program. Means of differentiation included acceleration and special curriculum for the students. Test scores, grade point averages and attendance data of the students were analyzed. Conclusions were positive. Academic gains had been made by students sampled. The program had positive effects on reading and math skills. Finally, attendance of the students had increased since entry in the program.

Robinson, Michael L., "SEAGULL: A Project for Releasing the Potential of the Gifted," Childhood Education 56:268-73, April-May, 1980.

A study was undertaken of Project SEAGULL, which was designed to meet the needs of gifted students grades 5 and 6. The focus was on the three I's: identity, inquiry and interaction. The self-concept of the gifted was a prime concern. Students felt isolated and different in the regular classroom. When brought together, they found others with shared interests and perceptions. The inquiry section of the program was the approach to learning. Many found the regular classroom lacking in stimulation. In the program, students excelled in areas of research as well as basic skills. The third component, interaction, was necessary to develop appropriate social behavior. Some gifted were loners, others were spoiled and abrasive. Evaluation of the program showed SEAGULL students had significantly higher self-esteem mean scores than the control group. Students as well as parents rated the program highly in a survey using program students and a control group.

Magnet Schools

Evans, Charles L., Elementary Magnet Plan Evaluation, 1975-76, Educational Resources Information Center, ED 140 496, November, 1977, 69 pp.

Evans studied the effects of a magnet school approach on reading and math test scores of gifted students. Students in grades 4-5 who scored 77 percent or above on the ITBS were bussed to a homogeneous grouping in a selected magnet school. The comparison group was students of similar abilities who chose not to participate in the program. Results showed that on 10 variables, five indicated significant gains while five showed non-significant gains in favor of the magnet schools. In no case, did the neighborhood achievement exceed the magnet school achievement. Teachers, students and parents involved in the magnet school program agreed they liked the concept. Teachers' only complaint was that criteria for entry was too low.

Nelson, Linda, "Science Needs in Montclair," Science and Children 17:38-39, February, 1980.

Montclair Public Schools in New Jersey have restructured the school day for children in their magnet school concept. Kindergarten through second grade are housed at one school, third through fifth at another. Students possessing a high aptitude for one or two particular subjects or high aptitude in all subjects can enroll in the school. Instruction is at three levels. The basics level exposed children to traditional curriculum. In aesthetics, enrichment and exploratory courses are offered in 16 areas. Students choose these courses according to their interests. The third level is creative I. Strong talents are encouraged through private lessons, small group work, and lessons with outside specialists. Students have shown growth in achievement test scores. More importantly, according to Nelson, they have developed a strong positive concept about school and themselves.

Saturday/Summer Programs

Feldhusen, John, and Sokol, Leslie, "Extra-School Programming to Meet the Needs of Gifted Youth: Super Saturday," Gifted Child Quarterly 26:51-56, Spring, 1982.

Gifted children have special needs that are different from that of the average or low ability child, so say Feldhusen and Sokol. Their research study was conducted to see if the Super Saturday program was meeting these needs for gifted children. Super Saturday is, as the name implies, an enrichment program for children held on Saturdays at Purdue University. Students, parents and staff were surveyed to see if the following needs were being met: cognitive, affective-social and generative. The researchers concluded that the Super Saturday program is fulfilling some vital needs in the lives of gifted children. Cognitive needs were met by high level, fast paced, in depth instruction. Affective- social needs were met through interaction with academic peers. Finally, generative needs were fulfilled through the opportunity to solve problems and create.

Hampton, Nellie D., Effects of Special Training on the Achievement and Adjustment of Gifted Children, Educational Resources Information Center, ED 002 906, Office of Education (DHEW), Washington, D.C., 1961, 84 pp.

The effects of training given to a group of gifted children in a special summer program were tested the following school year with respect to achievement and adjustment. Approximately 170 gifted sixth graders participated in the study. Of these, 60 were selected for the summer program. They represented the experimental group. Students in the special program were given in-depth training in curricular areas such as math and language arts. They were also exposed to activities to develop a healthy self-concept. Results of the study showed definite superiorities by the experimental group, particularly at certain intelligence-achievement combinations. Implications of this research were that schools may not be doing, during the regular school year, all that could be done to help children achieve their potential, and that the summer program had merit for continued used.

Program Differentiation

House, Ernest R., and others, Patterns of Cognitive and Affective Emphasis in Gifted and Average Classes, Educational Resources Information Center, ED 056 442, Center for Instructional Research and Curriculum Evaluation, Urbana, Illinois, February, 1971, 16 pp.

A study was undertaken of 131 Illinois classes grades 6-12. The purpose of the study was to determine what patterns differentiated gifted and average classes? One group of 62 gifted classes was compared to a group of 69 average classes. Data from a Class Activities Questionnaire was used in the evaluation. Significant differences were found in the degree of emphasis on higher thought processes, classroom focus, and classroom climate. Specific differences were: as a group, average classes emphasized three of seven levels of Bloom's Taxonomy while gifted classes emphasized six of seven; average classes had a higher amount of teacher talk time with little chance for discussion, while gifted classes had much; average classes revealed an absence of enthusiasm, while gifted classes had an abundance; and gifted classes were allowed much more independence of work.

Tuttle, Fredrick B., Jr., Gifted and Talented Students, National Education Association, Washington, D.C., 1978, 15 pp.

Homogeneously grouped programs, as defined by Tuttle, have specific criteria and select students on the basis of that criteria. Homogeneous programs for the gifted range from separate schools to weekend or summer programs. Rationale for this type of program is that the gifted will benefit from interaction with academic peers and from instruction geared to meet their particular needs. Tuttle, felt people who oppose such a program have relied on opinion rather than evidence. After reviewing the research he indicated that homogeneously grouped students fared better academically and socially than gifted in heterogeneous classes. (Simpson and Martinson, 1961)

PROGRAMS WITH VARIED ALTERNATIVES

Durr, William K., Reading and the Gifted Student, Educational Resources Information Center, ED 197 301, Paper presented at the Annual Meeting of the Southwest Regional Conference of the International Reading Association, San Antonia, January, 1981, 22 pp.

Durr cited studies of three program alternatives for gifted students as they related to reading. Shown was the fact that acceleration better prepared students academically while not damaging them socially. Enrichment was proven to be a valuable tool to be used in the regular classroom as something extra for those who finished the regular curriculum. Durr pointed to studies that showed special classes for the gifted were the most beneficial because of the great academic gains made by students.

Hershey, Myrliss, "Approach to Mainstreaming for Gifted Children," Education Digest 47:54-6, March, 1982.

The phrase "least restrictive environment" takes on an inverse meaning when applied to the gifted student who might find the regular classroom restrictive to intellectual needs. This analysis of gifted programs in Kansas attempted to show how the regular classroom could become less restrictive. A comprehensive screening procedure would identify the top 2-3 percent of the student population. These students would be "first stream." They would receive individual education planning (IEP) and special services from a consultant. "Second stream" students were those who were in the top 5 percent but received no IEP. Options for these students might include pull-out programs or cluster groupings. The top 6-10 percent would be "third stream." They would receive limited enrichment in the regular classroom. Hershey felt our schools must invest in the least restrictive environment for the gifted. "Mainstreaming" the gifted is a way.

Morra, Frank Jr., and Hills, Richard, Evaluation of the Alexandria, Virginia Program for Talented Elementary Students, Educational Resources Information Center, ED 172 484, Paper presented at the Annual Convention of the American Educational Research Association, Washington, D.C., March, 1978, 8 pp.

This research study used gifted children to ascertain the effectiveness of three types of program alternatives. The interest activity approach was a pull out program where special areas of expertise were nurtured outside the regular classroom. The curriculum area learning center was an advanced homogeneous class that substituted for the regular classroom. Enrichment was administered by regular classroom teachers with aid from specialists in the field. Students in these programs were compared to a control group with a similar I.Q. who opted not to be in the program. Results showed that student gains in all programs surpassed those of the control group. The highest gains were made in the homogeneous curriculum learning center especially in the area of math. Researchers summarized that these programs stimulated growth in academic achievement, creativity and social relations.

Nissen, Myra H., "Flight From Mediocrity," National Elementary Principal 51:81-88, February, 1972.

California's Mentally Gifted Minor Program provides supplemental funds to school districts for identification and instruction of gifted children. Two general categories of programs are: special services and special day classes. Special services are given to gifted children in the regular classroom by use of advanced materials and teacher consultants. Students are also placed in grades more advanced than their chronological age group. The second alternative is special day classes in which children are grouped homogeneously. These classes are designed to meet the individual academic needs of the students. An advantage listed with this type of program was the challenge of working with children of similar ability. Recommendations of this study were for a flexible learning environment in which gifted youngsters can work at their own pace with opportunity for independent study.

Renzulli, Joseph S., An Evaluation of Project Gifted 1971-1972, Educational Resources Information Center, ED 093 135, Bureau of Elementary and Secondary Education, Washington, D.C., 1972, 84 pp.

Evaluated was Project Gifted, a tri-city (Cranston, East Providence, and Warwick, Rhode Island) program which focused on the training of gifted children in grades 4-6 in the creative thinking process. Project goals were to offer a differentiated program for gifted students. Cranston's program involved a full-time homogeneously grouped class which covered all curriculum areas using special methodology and content to promote critical and evaluative thinking. East Providence's program had 2½ hours of daily special instruction in the humanities which expanded upon the regular classroom curriculum depending on student interest. Warwick's phase of Project Gifted involved a special curriculum featuring differential experiences in creative writing and the visual arts. The evaluative models used provided both formative and summative information on changes in student performance and attitudes resulting from program participation. Results of analyses of performance test results, classroom atmosphere, parent questionnaires and creativity test scores showed all three programs to be highly successful.

Simpson, Ray, and Martinson, Ruth, Educational Programs for Gifted Pupils: A Report to the California Legislature, Educational Resources Information Center, ED 100 072, California State Department of Education, Sacramento, January, 1961, 68 pp.

A study of the program alternatives in California was presented. Enrichment through special consultants, interest groupings and Saturday programs were one form. Another widely used strategy was acceleration. A child was grade advanced to be with academic peers. Special classes were also utilized. Children were grouped homogeneously to work in an all day setting with peers of similar ability. Teacher, student, and parent inventories were administered over a several year period to judge satisfaction of the program. Ninety-six percent of the pupils felt the programs were beneficial and wanted to continue. Parents' and teachers' ratings were similar. The programs' main value was ascertained to be that they allowed students the opportunity to progress at their own rate. Research also showed that reading and math scores were significantly higher for the children participating in the programs than of children of similar ability who opted not to be in a program for gifted students.

FACTORS TO CONSIDER IN DIFFERENTIATION

Johnson, Martin L., "Identifying and Teaching Mathematically Gifted Elementary School Children," Arithmetic Teacher 30:25-26+, January, 1983.

Mathematically gifted elementary students are, according to Johnson, students who generalize quickly, eliminate intermediate thinking steps and have flexibility of thought. He felt these students master the basics quickly and need more than accelerated computational activities. Johnson recommended open-ended activities: ones that have a minimum of clues as to how to solve and preferably not a single solution. Another type of activity is the inductive-discovery teaching strategy. In concluding, Johnson remarked that gifted students must be allowed to develop both quantitative and qualitative mathematic abilities.

Renzulli, Joseph S., "Identifying Key Features in Programs for the Gifted," Exceptional Children 35:217-21, November, 1968.

The intent of this research study was to isolate those features within programs for gifted that are considered, by recognized authorities in the field, to be most necessary in a differentiated program. A list was compiled of criteria used by state and local authorities to evaluate special programs for the gifted. Then, a panel of 21 expert judges ranked each item in order of importance. All rankings were tabulated with the following deemed key features of a worthy program: the teacher, the curriculum, student selection process, a statement of philosophy and objectives, staff orientation, a plan of evaluation, and administrative responsibility.

Renzulli, Joseph S., "What Makes a Problem Real: Stalking the Illusive Meaning of Qualitative Differences in Gifted Education," Gifted Child Quarterly 26:147-56, Fall, 1982.

Renzulli stated the term "qualitative differentiation" had been a controversial subject in the field of gifted education. His solution, to the problem of differentiation, was to use the "modus operandi" of prototypes of gifted persons. That was, "the pursuit of a Real Problem." Renzulli characterized a "Real Problem" as one that had no existing solution, required a personal commitment, and brought about change and/or contributed to something new in the sciences, arts or humanities. He stated that enrichment, creativity training, and acceleration should all be included in programs for the gifted. However, he equated solving "Real Problems" with qualitative differences in learning.

SUMMARY

Acceleration is frequently criticized on the grounds of possible social and emotional harm to the child. Horne and Dupuy commented that every educator who objected to acceleration seemed to have known a student who was accelerated and became a social misfit. Data have not shown this to be accurate in the majority of cases.

Stanley and Terman both found in separate research on gifted students that those eager to move ahead had no social or emotional ill effects. Moreover, Horne and Dupuy found that gifted students not allowed to accelerate manifested more signs of maladjustment than peers who had the opportunity to skip a grade. The accelerated gifted students studied by Mirman seemed quite well adjusted. A large number of these students recommended acceleration for others.

Klausmeirer stated a second objection to acceleration was that students would miss valuable information in the grade skipped. This in turn, it was asserted, would lead to lower achievement. In a study of accelerated students, Klausmeirer found this claim to be invalid. When compared to students of similar I.Q. who were two years older, the accelerated students' achievement scores were equal.

Advocates of acceleration such as Stanley objected to enrichment for gifted students. Most forms of enrichment, he claimed, were irrelevant to the real intellectual needs of the

student. Researchers Horne and Dupuy, also opponents of enrichment, stated that teacher bias to this approach often made it ineffective.

However, advocates of enrichment, Barthe and Keller could show positive gains in achievement after use of this method. Advancement in the areas of reading, math and science were particularly evident. Catmull and Dunlap called enrichment stimulating and motivating and said it often provided unique learning experiences which the regular classroom teacher would not have time to initiate.

On the subject of teacher bias to pull out enrichment programs, Parke reported this was valid. Teachers feared a depletion of the high achieving students would eliminate a stimulating classroom atmosphere.

Objections by teachers and parents alike are prompting school districts to consider programs for the gifted that can be carried out in the regular classroom. Brumbers and Toledo found this could be accomplished with the right teacher. Parke showed through research that changing the method of instruction to a self-paced, self-directed form could prove effective in the regular classroom. Gifted children could make achievement gains and never leave the regular classroom environment.

The danger Parke went on to stress was a classroom where no provisions for the gifted were made. Studies by Ness and Latessa showed performance levels of gifted students became more like other students the longer they received identical programs.

Another form of enrichment to be used inside the regular classroom or out is a mentor program. Many advantages to this approach were cited. Booth felt students gained responsibility. They also were able to work on projects of interest with adult guidance. Gray and Boston pointed out that with the right pairing, students and mentors could make great accomplishments to both self and society.

In reviewing the merits of enrichment, Nissen found when implemented properly with goals and objectives, it was a worthwhile curricular alternative. Enrichment, stressed Renzulli, must be qualitatively different, not just "more of the same."

Tuttle stated that homogeneous programs range from separate schools for the gifted to summer or weekend institutes. The main opposition to this type of program, asserted Barbe, was the trouble students may have in adjusting to the real world after being segregated with academic peers. Will they become elitist? Won't they feel isolated or different? Barbe showed that homogeneous grouping, rather than causing adjustment trouble, seemed to help in later life adjustment. Robinson found most gifted students felt isolated and different in the regular classroom. Whereas in the homogeneous setting, Gourley, Nelson and Robinson found an improvement in concept towards school and themselves.

In addition to the social benefits, the academic gains were also encouraging. According to Evans, Nelson and others,

achievement scores were higher for homogeneously grouped students when compared to academic peers in heterogenous classes. Morra and Hills found math scores to be especially influenced.

Although achievement gains were found in all three types of program differentiation, homogeneous grouping had other advantages. Feldhusen, House and Nissen cited the ability to be able to work at one's own pace to be of significant merit. Another advantage was the challenge of working with academic peers, so say Gourley and Nissen. Researchers House and Robinson pointed to enthusiasm in homogeneous classes that is often lacking in gifted students in regular classrooms.

With all of these positive effects, Simpson and Martinson indicated that homogeneously grouped students fared better academically and socially than gifted in heterogeneous classes. Their recommendation was for homogeneous grouping for the gifted when feasible.

A 1972 Office of Education Report asserted that the least productive results for gifted students came from regular classes. If this is accurate, the key features of a gifted program become important in establishing appropriate educational opportunities for these students.

Renzulli found that most important in any program alternative were: the teacher, the curriculum, and the selection process. Also vital were the statement of goals and

objectives of a program. Renzulli felt a program without objectives lacked continuity. If a differentiated program for the gifted is to be established, Renzulli stated, do not hastily assemble adaptations but rather provide a well thought out quality program.

CONCLUSIONS

Gifted children require differentiated educational programs beyond those normally provided by the regular school curriculum in order to realize their contribution to self and society. If Marland's statement is accurate, how best do we serve this population of students?

Acceleration, the least used of the three alternatives, seems to have much merit. It was shown to be especially successful for children gifted in mathematics. Horizontal enrichment works well in some subject areas, but math seems structured for vertical acceleration.

Since acceleration was shown in many studies not to cause social and emotional maladjustment, this alternative seems appropriate for students who are eager to move ahead. This may be the key to acceleration. It is a choice that must be made for each individual child. One who is not eager for advancement, and the hard work it entails, may encounter difficulty.

Enrichment was cited as the most widely used of the three program strategies. Students are not totally separated

from their chronological peers nor faced with new social situations. They are able to take an area of interest and study it intensely. This alternative proved useful to a broad spectrum of gifted children. Often however, it proved not to be enough for the highly gifted student. Students generally are only removed for enrichment for a short period of time. They must then face the prospect of returning to a classroom where their needs remain unmet.

A properly guided enrichment program whether it be pull out, in class or mentorships, can provide challenge and self-confidence for a gifted child.

Homogeneous programs seemed to provide the best environment for gifted students, if such a program is available. This alternative is challenging for a child who has not had to work very hard to "get by."

Peer stimulation is an advantage that is useful in helping to develop new ideas and concepts. Not only are academic peers stimulating, but the comfort of knowing one is not different is extremely helpful emotionally. With the accepting attitude of teacher and fellow students, a gifted child may begin to bloom, no longer afraid to express ideas that may have seemed strange in the regular classroom.

Ideally, there should be a variety of program services to meet the needs of every gifted child. Unfortunately, community support and funding will have a great impact on what course a school system will take.

The perfect program for every gifted child does not yet exist. The goal of educators should be to strive toward locating this enigma for one of our most precious of resources - our gifted youth.

RECOMMENDATIONS

It is recommended that:

1. each school system provide a differentiated curriculum which includes at least one of the following: acceleration, enrichment, or homogeneous grouping.
2. in addition, a variety of other alternatives be provided such as: mentors, individualized instruction, cluster groupings, and Saturday/Summer programs.
3. programming be flexible. Do not let chronological age be a barrier for school entry or acceleration.
4. if enrichment is chosen as the program for gifted children, make sure it has goals and objectives, not just a string of unconnected activities.
5. if homogeneous grouping is used make sure the students are not isolated totally from the general student population.
6. more longitudinal research be done on the various program alternatives. No program seems to have an edge on being the best. Research seemed to be scanty and when done, not on a long term basis.

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APPENDICES

APPENDIX A

National Resources for the Gifted and Talented

1. Office of the Gifted and Talented
   U.S. Office of Education
   Washington, D.C. 20202
   202/962-4038

   The Office of the Gifted and Talented was established in response to the findings of the 1971 Report to the Congress, Education of the Gifted and Talented. The office coordinates federal leadership in education of the gifted and talented.

2. National/State Leadership Training Institute on the Gifted and Talented
   316 West Second Street, Suite 708
   Los Angeles, California 90012
   213/489-7470

   This federally funded program aims to provide leadership training and technical assistance to the education of the gifted and talented, primarily through state education agencies.

3. National Clearinghouse for the Gifted and Talented
   The Council for Exceptional Children
   1920 Association Drive
   Reston, Virginia 22091
   703/620-3660

   The job of acquiring, synthesizing and disseminating information about gifted and talented education is the primary function of this clearinghouse. Additional information about support groups such as MENSA, National Science Foundation, and National Endowment for the Humanities may be obtained by writing to the Clearinghouse.

   Primary Source: Gallagher 1975, 403-405 pp.

APPENDIX B

National Organizations for the Gifted and Talented

1. The Association for the Gifted (TAG)
   The Council for Exceptional Children
   1920 Association Drive
   Reston, Virginia 22091
   703/620-3660

   Founded in 1958, TAG is a Division of the Council for Exceptional Children. A major function of TAG is to help both parents and professionals deal with the gifted and talented. TAG conducts national and regional conferences and provides information to members and affiliate organizations.

2. National Association for Gifted Children (NAGC)
   Route 5, Box 630 A
   Hot Springs, Arkansas 71901
   501/767-2669

   NAGC is a professional organization that is also open to parents. Conducting inservice for schools and consultation work for groups is a primary function. In addition, NAGC holds an annual conference and publishes The Gifted Child Quarterly.

3. The American Association for the Gifted
   15 Gramercy Park
   New York, New York 10003
   212/473-4266

   This organization consists of a group of professionals in the field of gifted and talented who meet to discuss issues related to gifted education. They also publish articles and texts on the gifted.

4. The Council of State Directors of Programs for the Gifted
   Florida State Department of Education
   319 Knott Building
   Tallahassee, Florida 32304
   904/599-5807

   The Council is a clearinghouse for information on gifted and talented programs in the various states. State programs vary and this organization can provide addresses for information from most states.

   Primary Source: Gallagher 1975, 405-407 pp.